

REMARKS

The Office Action mailed May 6, 2004, has been received and reviewed. Claims 1 through 6 are currently pending in the application. Claims 1 through 6 stand rejected. Applicants have amended claim 1, and respectfully request reconsideration of the application as amended herein.

Double Patenting Rejection Based on U.S. Patent No. 6,329,832

Claims 1 through 6 stand rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 9 through 14 of U.S. Patent No. 6,329,832. In order to avoid further expenses and time delay, Applicants elect to expedite the prosecution of the present application by filing a terminal disclaimer to obviate the double patenting rejections in compliance with 37 CFR §1.321 (b) and (c). Applicants' filing of the terminal disclaimer should not be construed as acquiescence of the Examiner's double patenting or obviousness-type double patenting rejections. Attached is the terminal disclaimer and accompanying fee.

35 U.S.C. § 103(a) Obviousness Rejections

Obviousness Rejection Based on U.S. Patent No. 6,590,285 to Davis et al.

Claims 1 through 6 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Davis et al. (U.S. Patent No. 6,590,285). Applicants respectfully traverse this rejection, as hereinafter set forth.

M.P.E.P. 706.02(j) sets forth the standard for a Section 103(a) rejection:

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or combine reference teachings. Second, there must be a reasonable expectation of success. Finally, **the prior art reference (or references when combined) must teach or suggest all the claim limitations.** The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). (Emphasis added).

The 35 U.S.C. § 103(a) obviousness rejections of claims 1 through 6 are improper because the elements for a prima facie case of obviousness are not met. Specifically, the rejection fails to meet the criterion that the prior art reference must teach or suggest all the claim limitations.

Applicant's independent claim 1 reads, in part:

1. A method for packaging a flip-chip semiconductor assembly, comprising:
providing at least one integrated circuit (IC) die . . . ;
providing a substrate . . . ;
placing ***dry conductive epoxy dots*** on the electrical pads on the substrate;
attaching the at least one IC die to the substrate with the bond pads of the at least one IC die in contact with the dry conductive epoxy dots on the electrical pads on the substrate to form the flip-chip semiconductor assembly ***with the dry conductive epoxy dots forming an electrical interface therebetween;***
electrically testing the flip-chip semiconductor assembly ***through the electrical interface of the dry conductive epoxy dots;***
if the flip-chip semiconductor assembly fails testing, then reworking . . . or scrapping the flip-chip semiconductor assembly . . . ; and
if the flip-chip semiconductor assembly passes testing, then encapsulating . . . (Emphasis added.)

The Office Action alleges that:

Davis et al. disclose providing at least one integrated circuit die having bond pads on a surface thereof (col. 4, line 43-45); providing a substrate having electrical pads for mounting the at least one IC die thereto (col. 4, lines 23-25); ***placing dry conductive epoxy dots*** on the electrical pads on the substrate (***col. 4, lines 38-41; col. 5, lines 9-17***); attaching the at least one IC die to the substrate with the bond pads of the at least one IC die in contact with the dry conductive epoxy dots on the electrical pads on the substrate to form the flip-chip semiconductor assembly (col. 5, lines 35-43); testing the flip-chip semiconductor assembly (col. 5, lines 55-68; col. 6, lines 1-4); -if the flip-chip semiconductor assembly fails testing, then reworking the flip-chip semiconductor assembly and retesting the flip-chip semiconductor assembly and retesting the flip-chip semiconductor assembly or scrapping the flip-chip semiconductor assembly if the flip-chip semiconductor assembly has already been reworked a preset number of times (col. 6., lines 17-26). (Office Action pp. 3-4; emphasis added).

Upon a close inspection of the cited portions of the Davis reference, Applicant

respectfully submits that the teaching of Davis is not consistent with the alleged teachings as characterized by the Office Action. Specifically, the Office Action states that Davis teaches of “placing dry conductive epoxy dots on the electrical pads on the substrate” at col. 4, lines 38-41 and col. 5, lines 9-17. (Office Action p. 3). Davis specifically teaches at col. 4, lines 38-41, “Step 110 includes positioning a component on the substrate by aligning a component with the substrate such that at least one lead of the component is juxtaposed with the conductive adhesive.” (Emphasis added.) And, at col. 5, lines 9-17, Davis specifically teaches, “Thermoset materials may be used for the tacky film, wherein application of heat forms the mechanical connection between the component and the substrate, However, it should be remembered that the mechanical connection should be temporary, allowing replacement or repositioning of the component when necessary. Thermoplastic materials may also be used, wherein application of heat allows replacement or repositioning of the component.” (Emphasis added.)

Applicant respectfully submits that in one disclosed embodiment, Davis utilizes two distinct substances in mechanically and electrically attaching the component to the substrate for testing. Specifically, “[t]he purpose of the tacky film is simply to provide additional strength to the mechanical connection between the component and substrate” (col. 5, lines 26-28) while “[p]artially curing the conductive adhesive allows for reworking without heat, yet forms a temporary electrical and mechanical connection suitable for testing that may be selectively transformed into a permanent connection (col. 5, lines 36-40).”

In Davis, the mechanical connection is formed by applying heat to the “tacky film” while the electrical connection is formed by partially curing the “conductive adhesive” following the placement of the component in mechanical coupling according to the “tacky film” by the “conductive adhesive.”

In contrast, Applicant claims, in part:

attaching the at least one IC die to the substrate with the bond pads of the at least one IC die in contact with the dry conductive epoxy dots on the electrical pads on the substrate to form the flip-chip semiconductor assembly ***with the dry conductive epoxy dots forming an electrical interface therebetween;***
electrically testing the flip-chip semiconductor assembly ***through the electrical interface of the dry conductive epoxy dots;*** . . . (Applicant’s Amended

Independent Claim 1).

Applicant' invention, as claimed, utilizes a single coupling mechanism that provides the adequate mechanical **and** electrical interface through which the electrical testing is performed. Therefore, Applicant respectfully submits that Davis does not teach or suggest all the claim limitations of of the presently claimed inventions as set for the hereinabove. Applicant respectfully requests that the rejection of independent claim 1 based upon the cited prior art be withdrawn and amended independent claim 1, and claims 2-6 depending therefrom, passed to issue.

Applicant respectfully submits that claim 1-6 are clearly allowable over the cited prior art of record for the reasons set forth herein.

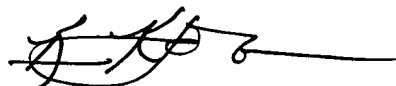
ENTRY OF AMENDMENTS

The amendments to claim 1 above should be entered by the Examiner because the amendments are supported by the as-filed specification and drawings and do not add any new matter to the application. Further, the amendments do not raise new issues or require a further search.

CONCLUSION

Claims 1-6 are believed to be in condition for allowance, and an early notice thereof is respectfully solicited. Should the Examiner determine that additional issues remain which might be resolved by a telephone conference, he is respectfully invited to contact Applicants' undersigned attorney.

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'K. Johanson', followed by a horizontal line.

Kevin K. Johanson
Registration No. 38,506
Attorney for Applicants
TRASKBRITT
P.O. Box 2550
Salt Lake City, Utah 84110-2550
Telephone: 801-532-1922

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KKJ/dlm:rmh

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